

REMARKS

Claims 1-25 are in the case. Claims 3-4 and 17 are indicated as being allowable, for which indications applicants thank the examiner. Claim 24 is objected to. Claims 1-2, 5-8, 12-15, and 19-25 are rejected under 35 USC § 102 over USAN 2002/0145185 to Shrauger. Claims 10-11, 16, and 18 are rejected under 35 USC § 103 over Shrauger in view of USAN 2001/0039644 to Le Coz. Claim 9 is rejected under 35 USC § 103 over Shrauger in view of USAN 2002/0053731 to Chao. Claims 2-6, 9-14, 16-19, and 24 have been amended. No new matter has been introduced by the amendments, which are supported by the disclosure of the original claims and the specification and drawings. Reconsideration and allowance of the claims are respectfully requested.

ALLOWABLE CLAIMS

Claims 3-4 and 17 are indicated as being allowable, and applicants have amended these claims as suggested by the examiner. Applicants have also amended claims 2, 5-6, 9-14, 16, and 18-19 to depend from these allowable claims, thus making them allowable as well. Therefore, only the rejections in regard to claims 1, 15, and 20-25 remain relevant.

CLAIM OBJECTIONS

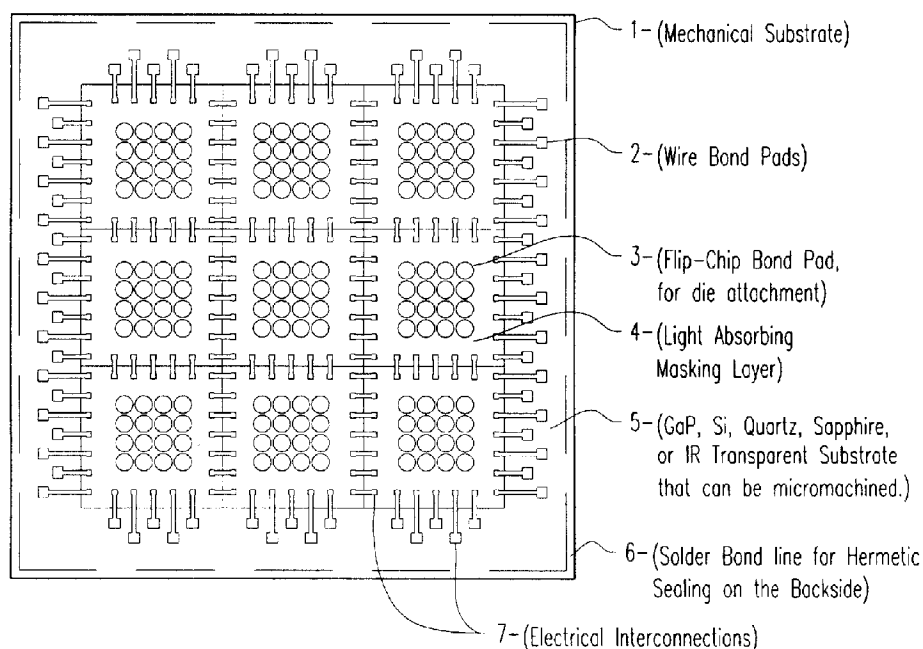
Claim 25 is objected to. However, applicants understand this to mean claim 24, which has been amended as suggested in the office action. Reconsideration and allowance are respectfully requested.

CLAIM REJECTIONS UNDER §102

Claims 1, 15, and 20-25 are rejected over Shrauger (the other claims having been amended to depend from allowable claims). Independent claim 1 claims, *inter alia*, (1) a substrate, (2) package connection pads positioned around a periphery of a top surface of the substrate, (3) a ring of die connection pads positioned within the array of package connection pads, and (4) an access region positioned within the ring of die connection pads, the access region configured to facilitate backside access to the integrated circuit

die by removal of as much as all of the access region without damaging electrical integrity of any circuit traces of the substrate. Shrauger does not describe such a combination of elements.

Shrauger describes (1) a substrate 1 with (2) package connection pads 2, and (3) multiple rings of die connection pads (nine rings in figure 1) disposed within the package connection pads. There is no access region that is configured to facilitate backside access to the integrated circuit die by removal of as much as all of the access region. Figure 1 in the cited published application is very difficult to interpret because it is so blurry and indistinct, and so it is beneficial to look at figure 1 from the issued patent 6,531,767, which matured from the cited application. Figure 1 from the patent is given below:



If the elements that are labeled as “3” in figure 1 are the flip-chip bonding pads that are used for die attachment (as described in figure 1), then it would be impossible to remove as much as all of the access region positioned within the ring of die connection pads without damaging the electrical integrity of the substrate. Thus, that is a first patentable distinction between claim 1 and Shrauger.

However, even if as much as all of the areas 3 and 4 (analogous to the access region within the interconnections 7?) could be removed, the substrate of Shrauger would

still not function in the same manner as the substrate of claim 1, because the substrate of claim 1 provides **backside access** to the integrated circuit die by removal of as much as all of the access region. As depicted in figures 4 through 12 of Shrauger, the substrate 1 of Shrauger provides optical **front side access** to the MEMS device. Thus, this is a second patentable distinction between claim 1 and Shrauger.

Further, it might be that figure 1 is mislabeled, and the elements 3 are the lens arrays L as depicted in other figures, and not the flip-chip bonding pads.

Regardless, there are at least two patentable distinctions between claim 1 and Shrauger. Thus, claim 1 patentably defines over Shrauger. Reconsideration and allowance of claim 1 are respectfully requested.

Claim 15 claims, *inter alia*, a method for designing an integrated circuit carrier **with backside access** to an integrated circuit, by placing an array of package connection pads around a periphery of a top surface of a carrier substrate, placing a ring of die connection pads within the array of package connection pads, the ring of die connection pads configured to provide electrically connectivity to an integrated circuit die, and **reserving an access region for conducting backside access to the integrated circuit die**, wherein no signal traces are disposed.

As described above, the substrate 1 of Shrauger does not provide backside access to the MEMS or reserve an access region for conducting access to such. Therefore, claim 15 patentably defines over Shrauger. Reconsideration and allowance of claim 15 are respectfully requested.

Claim 20 claims, *inter alia*, a method for packaging and **providing backside access** to an integrated circuit, by electrically connecting an integrated circuit die to a ring of die connection pads on a top surface of a carrier substrate, attaching a cover to a bottom surface of the carrier substrate, and removing a portion of the cover within an access region in order **to access a backside of the integrated circuit** without damaging any electrical connectivity of the substrate.

As described above, the substrate 1 of Shrauger does not provide backside access to the MEMS or reserve an access region for conducting access to such. Therefore, claim 20 patentably defines over Shrauger. Reconsideration and allowance of claim 20 are respectfully requested. Claims 21-23 depend from independent claim 20, and contain

additional important aspects of the invention. Therefore, claims 21-23 patentably define over Shrauger. Reconsideration and allowance of claims 21-23 are respectfully requested.

Claim 24 claims, *inter alia*, a system for packaging and ***providing backside access*** to a wide variety of integrated circuits with a carrier substrate; an array of package connection pads positioned around a periphery of a top surface of the carrier substrate; a ring of die connection pads positioned within the array of package connection pads; and an access region positioned within the ring of die connection pads, ***the access region configured to facilitate backside access*** to the integrated circuit die by removal of as much as all of the access region without damaging electrical integrity of any circuit traces of the carrier substrate.

As described above, the substrate 1 of Shrauger does not provide backside access to the MEMS or reserve an access region for conducting access to such. Therefore, claim 24 patentably defines over Shrauger. Reconsideration and allowance of claim 24 are respectfully requested. Claim 25 depends from independent claim 24, and contains additional important aspects of the invention. Therefore, claim 25 patentably defines over Shrauger. Reconsideration and allowance of claim 25 are respectfully requested.


CONCLUSION

Applicants assert that the claims of the present application patentably define over the prior art made of record and not relied upon for the same reasons as given above. Applicants respectfully submit that a full and complete response to the office action is provided herein, and that the application is now fully in condition for allowance. Action in accordance therewith is respectfully requested.

In the event this response is not timely filed, applicants hereby petition for the appropriate extension of time. If any fees are required by this amendment, such fees may be charged to deposit account 12-2252.

Sincerely,

LUEDEKA, NEELY & GRAHAM, P.C.

By: 

Rick Barnes, 39,596

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